STATEMENT OF WORK
PRE-REMEDIAL DESIGN AND REMEDIAL DESIGN
GOWANUS CANAL SUPERFUND SITE
BROOKLYN, KINGS COUNTY, NEW YORK

I. INTRODUCTION AND RECORD OF DECISION REQUIREMENTS

The purpose of this Statement of Work (SOW) is to specify the tasks Respondents shall undertake to design the remedy selected in the Record of Decision (ROD) issued by the U.S. Environmental Protection Agency (EPA) on September 27, 2013, for the Gowanus Canal Superfund Site (Site). This SOW is an attachment to the Administrative Order, Index Number CERCLA-02-2014-2001 (Order).

The ROD includes, but is not limited to, the following components:

- Dredging of the entire column of hazardous substance-contaminated sediments which have accumulated above the native sediments in the upper and mid-reaches of the Canal (referred to as "soft sediments").

- In-situ stabilization (ISS)[1] of those native sediments in select areas in the upper and mid-reaches of the Canal contaminated with high levels of nonaqueous phase liquid (NAPL).[2]

- Construction of a multilayered cap in the upper and mid-reaches of the Canal to isolate and prevent the migration of polycyclic aromatic hydrocarbons (PAHs) and residual NAPL from native sediments.

- Dredging of the entire soft sediment column in the lower reach of the Canal.

- Construction of a multilayer cap to isolate and prevent the migration of PAHs from native sediments in the lower reach of the Canal.

- Off-Site treatment of the NAPL-impacted sediments dredged from the upper and mid-reaches of the Canal with thermal desorption,[3] followed by beneficial reuse off-Site (*e.g.,* landfill daily cover) if possible.

- Off-Site stabilization of the less contaminated sediments dredged from the lower reach of the Canal and the sediments in the other reaches not

[1] ISS involves mixing of materials, such as Portland cement, into sediments to bind the contaminants physically/chemically.

[2] NAPL is concentrated liquid contamination, typically oil-like, that forms a separate phase and is not miscible with water.

[3] Desorption utilizes heat to increase the volatility of organic contaminants so that they can be removed and destroyed.

impacted by NAPL, followed by beneficial reuse off-Site.

- Excavation and restoration of approximately 475 feet of the filled-in former 1st Street turning basin.

- Excavation and restoration of the portion of the 5th Street turning basin beginning underneath the 3rd Avenue bridge and extending approximately 25 feet to the east and the installation of a barrier or interception system at the eastern boundary of the excavation.

- Implementation of institutional controls incorporating the existing fish consumption advisories (modified, as needed), as well as other controls to protect the integrity of the cap.

- Periodic maintenance of the cap and long-term monitoring to insure that the remedy continues to function effectively.

- Combined sewer overflow (CSO) control measures for the upper reach of the Canal to significantly reduce overall contaminated solid discharges to the Canal as follows:

    - Construction of in-line sewage/stormwater retention tanks to retain stormwater which currently discharges through outfalls RH-034 and OH-007. It is estimated that an 8-million gallon tank and a 4-million gallon tank shall be required to address CSOs from outfalls RH-034 and OH-007, respectively. In addition, outfalls located in the vicinity of outfalls RH-034 and OH-007 that contribute smaller CSOs shall be connected to the retention tanks. The location of the retention tanks shall be determined during the remedial design. While the sizes of the tanks shall be determined during the remedial design, they are expected to conform with the requirements of the Clean Water Act and to accommodate projected additional loads to the combined sewer system that result from current and future residential development, as well as periods of high rainfall, including future rainfall increases that may result from climate change.

    - In the event that the permanent measures described above are not implemented in a timely manner, interim controls, such as temporary solids capture and removal, shall be implemented to mitigate sediment from the CSO discharges until the permanent measures have been implemented.[4]

[4] It is unlikely that permanent measures to control the CSO discharges will be in place before the commencement of the remediation of the canal sediments.

- Implementation of appropriate engineering controls to ensure that hazardous substances and solids from separated stormwater, including from future upland development projects, are not discharged to the Canal.

- To prevent recontamination of the Canal following the implementation of the above-described remedial actions, the upland sources of hazardous substances, including discharges from three former manufactured gas plants (MGPs), CSOs, other contaminated upland areas and unpermitted pipes along the Canal, must be addressed prior to the commencement of, or in phased coordination with, the implementation of the selected remedy.

- The former MGP facilities are being addressed by National Grid, a potentially responsible party (PRP) for these facilities and the Site, under New York State Department of Environmental Conservation (NYSDEC) oversight. Based upon the first NYSDEC-selected remedy at one of these former MGP facilities and NYSDEC guidance for presumptive remedies at former MGP facilities, it is assumed that a range of actions shall be implemented at the facilities (that may include removal of mobile sources, construction of cut-off walls along the Canal, and active recovery of NAPL near the cut-off walls for each of the former MGP facilities) which shall prevent the migration of contamination from the former MGP facilities into the Canal. The cleanup of the former MGP facilities shall be completed in accordance with schedules agreed upon between the EPA and NYSDEC.

- In the unlikely event that timely and effective state-selected remedial actions are not implemented at a given former MGP facility, the EPA may implement actions pursuant to CERCLA to ensure the protectiveness of the selected remedy.

- Current and future high density residential redevelopment along the banks of the Canal and within the sewershed shall adhere to NYC rules for sewer connections (Chapter 31 of Title 15 of the Rules of the City of New York) and shall be consistent with current NYC Department of Environmental Protection (NYCDEP) criteria (NYCDEP, 2012) and guidelines to ensure that hazardous substances and solids from additional sewage loads do not compromise the effectiveness of the permanent CSO control measures by exceeding their design capacity.

- The remedy also includes the control or elimination of unpermitted pipe outfalls.

II. PERFORMANCE STANDARDS

Performance standards are the cleanup standards, Remedial Action Objectives, and other measures of achievement of the goals of the remedy selected in the ROD. The pre-Remedial Design (RD) and RD performed pursuant to this SOW shall be developed to achieve compliance with the Performance Standards. See ROD, "Remedial Action Objectives" and "Compliance with ARARs" sections and Order, Paragraph 10.k.

The following RAOs were established for the Site:

- Reduce the cancer risk to human health from the incidental ingestion of and dermal contact with PAHs in sediment during recreational use of the Canal or from exposure to Canal overflow to levels that are within or below the EPA's excess lifetime cancer risk range of 10^{-6} to 10^{-4}.

- Reduce the contribution of PCBs from the Gowanus Canal to fish and shellfish by reducing the concentrations of PCBs in Gowanus Canal sediment to levels that are within the range of Gowanus Bay and Upper New York Bay reference concentrations.

- Reduce the risks to benthic organisms in the Canal from direct contact with PAHs. PCBs and metals in the sediments by reducing sediment toxicity to levels that are comparable to reference conditions in Gowanus Bay and Upper New York Bay.

- Reduce the risk to herbivorous birds from dietary exposure to PAHs.

- Eliminate the migration of NAPL into the Canal so as to minimize NAPL serving as a source of contaminants, primarily PAHs, to the Canal.

III. COMMUNITY RELATIONS

To the extent requested by the EPA, Respondents shall provide information relating to the Work required hereunder for the EPA's use in developing and implementing a Community Relations Plan. As requested by the EPA, Respondents shall participate in the preparation of appropriate information disseminated to the public and participate in public meetings, which may be held or sponsored by the EPA, to explain activities at or concerning the Site.

IV. PRE-REMEDIAL DESIGN ACTIVITIES

A. Pre-RD activities shall be conducted by Respondents to gather sufficient information to fully develop the RD. Respondents shall perform pre-RD activities and investigations including, but not limited to, the following:

1. A detailed survey of the Canal bottom for performing pre-construction large debris removal;

2. A plan for debris removal, decontamination and disposal;

3. A survey and assessment, as it relates to the implementation of the remedy, of the integrity of existing bulkhead along the Canal and a determination of the extent of temporary bulkhead installation required for remedy implementation;

4. A plan for staging site selection and implementation of staging operations;

5. Data collection for the evaluation of groundwater upwelling at the Canal bottom for identification of groundwater discharge areas and measurements of discharge rate;

6. Evaluation of upland locations requiring cut-off walls or other remedial measures as a result of NAPL that has migrated to upland locations and determination of the extent (depth, length) of cut-off walls at each location;

7. Evaluation of Canal native sediment to identify areas of potentially mobile NAPL for the ISS treatment boundaries; and

8. A plan for compliance with Federal and State archeological requirements.

B. All work required under Section IV.A., above, shall be completed and all deliverables submitted to the EPA for approval no later than October 1, 2014.

C. National Grid entered into an Amendment to Administrative Order and Settlement Agreement (Settlement Agreement), Index Number CERCLA-02-2010-2009), which included a SOW ("Settlement Agreement SOW"). Consistent with Section IV of the Settlement Agreement SOW, National Grid developed and submitted for EPA approval a Pre-RD Work Plan on January 29, 2014. The EPA will either approve the Pre-RD Work Plan or

otherwise respond pursuant to Section IX (the EPA Approval of Plans and Other Submissions) of the Order.

V. REMEDIAL DESIGN ACTIVITIES

A. Respondents shall perform the RD of the remedy selected in the ROD. The RD activities to be performed pursuant to and in accordance with this SOW, the Order and the ROD include, but are not limited to, the following:

1. Development of planning documents including but not limited to work plans and schedules for remedy implementation. Tasks shall include pre-RD activities and investigations, preliminary design report (35% completion) which will include the findings and results of the pre-RD activities and investigations, an intermediate design (65%) and a final design report (100% completion). Schedules shall be consistent with the schedule for completion of the remedy specified in the ROD;

2. Detailed design of all the components of the remedy, described in Section I, including, but not limited to: the dredging of the "soft" sediment, capping with a multilayer cap, ISS, excavation and restoration of the portion of the 5th Street basin specified in the remedy, and treatment and disposal of dredged sediment, (except for the design of the CSO retention tanks and the restoration of the 1st Street basin, to be performed by New York City);

3. Tasks required for implementing institutional controls;

4. Tasks for construction, operation, and maintenance of all remedy components;

5. Tasks to monitor the effectiveness of ISS, the active cap, the cut-off walls and retention tanks;

6. To the extent that the EPA conducts data collection and any ISS pilot study work, Respondents shall incorporate such work into the RD; and

7. Tasks to identify how the RD and the RA will be implemented using the principles specified in the EPA Region 2's Clean and Green Policy and NYSDEC's Green Remediation Policy.[5]

[5] See http://epa.gov/region2/superfund/green_remediation and http://www.dec.ny.gov/docs/ remediation_hudson_pdf/der31.pdf.

VI. REMEDIAL DESIGN WORK PLAN

Consistent with Section V of the Settlement Agreement SOW, National Grid developed and submitted for EPA approval an RD Work Plan on February 27, 2014. The EPA will either approve the RD Work Plan or otherwise respond pursuant to Section IX (the EPA Approval of Plans and Other Submissions) of the Order.

VII. REMEDIAL DESIGN

A. Respondents shall perform the RD activities in conformance with the RD Work Plan approved by the EPA and within the time frames specified in the RD schedule contained in the EPA-approved RD Work Plan.

B. In accordance with the schedule set forth in the EPA-approved RD Work Plan, Respondents shall submit the findings of the pre-remedial design investigations in the preliminary design report (35% completion). The findings should include the results and analysis of all data collected during the pre-remedial design field studies.

C. The RD Reports (35%, 65% and 100% completion) shall be submitted to the EPA in accordance with the schedule set forth in the EPA approved RD Work Plan. The RD Reports shall include a discussion of the design criteria and objectives, with emphasis on the capacity and ability to meet design objectives successfully. The RD Reports shall also include the plans and specifications that have been developed at that point in time, along with a design analysis. The design analysis shall provide the rationale for the plans and specifications, including results of relevant sampling and testing performed, supporting calculations and documentation of how these plans and specifications will meet the requirements of the ROD and shall provide a discussion of any impacts these findings may have on the RD. In addition to the above, the RD Reports shall include the following items:

    1. Specifications for photographic documentation of the remedial construction;

    2. A discussion of the manner in which the Remedial Action (RA) will achieve the Performance Standards;

    3. A discussion of the manner in which the RA will comply with the EPA Region 2's Clean and Green Policy;

    4. A draft schedule for RA activities;

5. The draft schedule for the RA shall provide for the completion of the installation of the remedy within 6 months of the EPA's approval of the RA Work Plan. The draft schedule for RA and monitoring activities may be revised during the remedial process, subject to the EPA's approval;

6. A preliminary Construction Quality Assurance Project Plan which shall detail the approach to quality assurance during construction activities at the Site;

7. A report describing those efforts made to secure access and obtain other approvals and the results of those efforts; and

8. A plan for implementation of construction and construction oversight.

D. The EPA's comments on the preliminary design report (35%) shall be incorporated by Respondents into the intermediate design report. EPA's comments on the intermediate design report (65% completion) shall be incorporated by Respondents into the final design report (100% completion).